



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/780,140	02/17/2004	William E. Dougherty JR.	YOR920030437US1 (8728-653)	9678
46069	7590	04/12/2006	EXAMINER DINH, PAUL	
F. CHAU & ASSOCIATES, LLC 130 WOODBURY ROAD WOODBURY, NY 11797			ART UNIT 2825	PAPER NUMBER

DATE MAILED: 04/12/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/780,140

Applicant(s)

DOUGHERTY ET AL.

Examiner

Paul Dinh

Art Unit

2825

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 2/17/04 to 7/29/05.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 112

*The following is a quotation of the second paragraph of 35 U.S.C. 112:
The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.*

Claims 1-14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1, and 13-14 and dependencies are rejected because “the routability” in claims 1, and 13-14 lacks antecedent basis.

Claim 5 is rejected because “the technology mapping” lacks antecedent basis.

Claim 6 is rejected because “the buffer stage” lacks antecedent basis.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) The invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) The invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

1. Claims 1, 4-5, 7-9, and 13-14 are rejected under 35 U.S.C. 102(e) as being anticipated by the prior art of record Sanie et al (US Pub. 2004/0210856) (Claim 1 and similarly recited claims 13-14)

Creating a structural metric prior to physical design (fig 3), the structural metric being proportional to the routability of the circuit design model after the physical design (fig 3, para. 0043); and

Using the structural metric during logic synthesis (fig 3) to create an optimized circuit design model (abstract, para 0042-0044, claim 1).

(Claims 4-5) wherein using the structural metric during logic synthesis comprises using the structural metric during a technology independent synthesis stage of the logic synthesis (fig 1, 3, para 0005, 0009, 0039); during the technology mapping stage of the logic synthesis (fig 1, 3, para 0005-0005-0009).

(Claims 7-8) further comprising incrementally updating the structural metric when logic changes are made to the circuit design model (fig 1-3); wherein incrementally updating the structural metric when logic changes are made to the circuit design model comprises performing recomputation on circuits involved in an optimization and circuits affected by the optimization to provide a structural metric cost (fig 3).

(Claim 9) wherein incrementally updating the structural metric when logic changes are made to the circuit design model comprises maintaining information regarding circuits affected by an optimization, which are computed when recomputation of the structural metric is necessary (fig 1-3).

2. Claims 1-2, 4-7, 9-10, 13-14 are rejected under 35 U.S.C. 102(b) as being Anticipated by the prior art of record Higashida (USP 6006023)

(Claim 1 and similarly recited claims 13-14)

Creating a structural metric prior to physical design (fig 9-19), the structural metric being proportional to the routability of the circuit design model after the physical design (fig 9-19, col 2 line 25+, col 4 lines 5-8); and

Using the structural metric during logic synthesis to create an optimized circuit design model (fig 1, 11-12, 17-19).

(Claim 2) wherein using the structural metric during logic synthesis to create an optimized circuit design model comprises adding, deleting or substituting one or more circuits using a combination of Boolean, algebraic and electrical optimizations to create an optimized circuit design model (fig 1-12, 17-19).

(Claims 4-5) wherein using the structural metric during logic synthesis comprises using the structural metric during a technology independent synthesis stage of the logic

Art Unit: 2825

synthesis (fig 11-12, 19); during the technology mapping stage of the logic synthesis (fig 11-12, 19).

(Claim 6) wherein using the structural metric during logic synthesis comprises using the structural metric during the buffering stage of the logic synthesis (fig 1, 4, 9-13, 15-16, 19)

(Claims 7, 9) further comprising incrementally updating the structural metric when logic changes are made to the circuit design model (fig 1-19); logic changes are made to the circuit design model comprises maintaining information regarding circuits affected by an optimization, which are computed when recomputation of the structural metric is necessary (fig 1, 3, 11-19).

(Claim 10) wherein creating the structural metric comprises creating any one of a distance metric, a sum-of-all-pairs-min-cut ("SAPMC"), and an expansion metric (fig 1-6, 9-12, 17-19).

Allowable Subject Matter

Claims 3 and 11-12 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Claims 3 and 11-12 would be allowable because the prior art of record does not teach or suggest the limitations in claim 3 and claim 11

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Paul Dinh whose telephone number is 571-272-1890. The examiner can normally be reached on Monday to Friday from 8:30am to 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's Supervisor, Jack Chiang can be reached on 571-272-7483. The fax number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2825

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read "Paul Dinh", with a long, sweeping horizontal stroke extending to the right.

PAUL DINH
PRIMARY EXAMINER